

## ABSTRACT OF THE DISCLOSURE

Numbers 1, 2, ..., M are assigned to bidding prices from the minimum to maximum values  $V_1$  to  $V_N$ . For a bidding value  $V_{vi}$  each user 11-i generates two sequences of information  $s_i = \{s_{i,1}, s_{i,2}, \dots, s_{i,M}\}$  and  $t_i = \{t_{i,1}, t_{i,2}, \dots, t_{i,M}\}$  such that  $s_{i,1} = t_{i,1}, \dots, s_{i,vi-1} = t_{i,vi-1}, s_{i,vi} \neq t_{i,vi}, \dots, s_{i,M} \neq t_{i,M}$ , then secretly

5 sends the two sequences of information  $s_i$  and  $t_i$  to quantitative competition apparatuses 15A and 15B, respectively, and sends hash values  $H1_i = h(s_i)$  and  $H2_i = h(t_i)$  of the two sequences of information  $s_i$  and  $t_i$  and a hash value  $h(V_{vi} || r_i)$  containing an intended value  $V_{vi}$  to a bulletin board apparatus 21.

10 The quantitative competition apparatuses 15A and 15B extract w-th elements  $s_{i,w}$  from respective sequences  $s_1$  to  $s_N$  and w-th elements  $t_{i,w}$  from respective sequences  $t_1$  to  $t_N$ , then create a concatenation  $Seq_{s,w}$  of N elements  $s_{i,w}$  and a concatenation  $Seq_{t,w}$  of N elements  $t_{i,w}$ , then compare them using a one-way function without revealing their values, and, if they differ, deciding that the

15 intended value  $V_{vi}$  equal to or smaller than a value  $V_w$  is present, and determines the minimum value by changing w.

5 10 15 20